

REMARKS

Favorable reconsideration is respectfully requested.

The claims are 1-7.

Claims 1-7 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Masuda et al. (U.S. 6,428,856) in view of Bähler (U.S. 5,648,408) with Ohtomo et al. (U.S. 5,475,049), Chase (U.S. 3,102,856) and Ashton et al. (U.S. 3,684,197) to show inherent properties of talc.

This rejection is respectfully traversed.

A brief discussion of the present invention will be of assistance in appreciating Applicants' reasons for traversal of the rejection.

It is already known to form, on exterior surfaces of an automobile body etc., a multi-layer coating film by 3C1B method, i.e., by applying intermediate paint, metallic paint and clear paint in this order, and curing the resultant coatings simultaneously by heating. It is often seen that this multi-layer coating film is hit by gravel spattered by a running car, and thus partially peels off (which phenomenon is called "chipping"). In order to resolve this chipping, it has been proposed to place flexible coating film between coating film layers. This method is, however, undesirable since it increases the number of coating process steps.

The objective of this invention is to improve, without increasing the number of coating process steps, the chipping resistance of a multi-layer coating film which is formed by the 3C1B method with use of intermediate paint, metallic paint and clear paint.

This invention relates to a process for forming a multi-layer coating film by applying, to a substrate, intermediate paint, metallic paint and clear paint by 3C1B method, which process is characterized in that said intermediate paint:

(a) contains 0.5 to 5 phr of flat talc powder of a size of:

(1) 0.5 to 10 μm in length and

(2) 0.01 to 1 μm in thickness, and

(b) has a total pigment content of 40 to 100 phr.

In order that the objective of the present invention may be achieved, it is important that the intermediate paint to be used should simultaneously satisfy all of the requirements (a), (a)(1), (a)(2) and (b) as prescribed above. When even one of these requirements is not met, the objective of the present invention cannot be attained, as is clearly seen from Comparative Examples 1 to 8 which are mentioned in the present specification, page 6, line 5 ff., and from the data in the table on page 10 of the same which shows the results of these Comparative Examples.

In intermediate paint to be used, when talc is missing (Comparative Example 1), when talc is replaced with another extender pigment such as clay, barium sulfate and mica (comparative Examples 2 to 4), when the talc used has a length of more than 10 μm (Comparative Example 5), when the total pigment content is less than 40 phr (Comparative Example 6), when total pigment content is more than 100 phr (Comparative Example), or when more than 5 phr of talc is blended (Comparative Example 8), the thus obtained multi-layer coating film is far inferior to the one which is obtained in Example 1 of the present invention with respect to chipping resistance and coating film surface smoothness.

Turning to the cited references, they teach or suggest nothing about the aforementioned features and advantages of the present invention, as will now be discussed.

1. Masuda et al. disclose a process to form a coating film by applying, on a substrate, water-borne intermediate coating, a water-borne metallic base coating and a clear coating by 3C1B method. In column 6, lines 20-21, of the same, it is also mentioned that an extender pigment such as talc may be blended with the intermediate coating.

In Masuda et al., however, talc is mentioned only as an example of an optional component which may be blended with the intermediate coating. In fact, Masuda et al. give no concrete example of an intermediate coating in which talc is blended.

Furthermore, as the rejection recognizes, Masuda et al. neither teach nor suggest that talc is an essential component of an extender pigment which is to be contained in the intermediate coating, that said talc has a size of 0.5 to 10 μm in length and 0.01 to 1 μm in thickness, that the amount of said talc blended is 0.5 to 5 phr, and that the intermediate coating has a total pigment content of 40 to 100 phr.

Hence, it would have been impossible to predict, from Masuda et al., the remarkable effects of the present invention which are produced by using talc of a specific size in a specific amount in an intermediate coating to be used for the formation of multi-layer coating film by the 3C1B method.

It is thus apparent that Masuda et al. provides no suggestion of the present invention.

2. Bäbler relates to a method of coloring a high molecular weight organic material, which comprises uniformly dispersing an effective pigmenting amount of a stir-in pigment in the high molecular-weight organic material by stirring the stir-in pigment into a suspension or solution of the high molecular-weight organic material; wherein the stir-in pigment is a conditioned organic pigment with an average particle size of 0.1 to 9 μm and a specific surface area in the range of from 6 to 35 m^2/g .

Bäbler further mentions that this organic pigment is prepared by wet-milling a pigment crude (claim 8); that the pigment crude is milled in the presence of organic pigment, a texture-improving agent, anti-flocculent and/or extender (claim 10); that the extender is mica, talc, kaolin or silica with an average particle size in the range of from 1 to 10 μm (claim 13); and that the high molecular-weight organic material is an aqueous or solvent based automotive paint system (claim 20).

Bäbler has, however, nothing to do either with the formation of multi-layer coating film by 3C1B method or with the coating of automotive body by 3C1B method. It is evident, therefore, that Bäbler provides no hint about the improvement of chipping resistance which is a problem in the formation of multi-layer coating film by the known 3C1B method.

Of course, Bäbler neither teaches nor suggests an intermediate paint which satisfies the requirements (a), (a)(1), (a)(2) and (b) as defined in Claim 1 of the present application.

Such being the case, Bäbler fails to overcome the above-discussed deficiencies of Masuda et al.

3. Ohtomo et al. disclose a resin composition comprising a polyphenylene ether resin, a polyamide resin, and a plate or flake like inorganic filler having an average particle size of no more than 5 μm and an aspect ratio of no less than 3.

This resin composition is, however, used for the production of blow-molded products, and has nothing to do with a paint composition.

Therefore, Ohtomo et al. provides no motivation for blending talc of a specific size in a specific amount with an intermediate paint with a view towards improving chipping resistance of a multi-layer coating film to be prepared by 3C1B method.

4. Chase relates to the improvement of talc powder to be applied to skin, and Ashton et al. also pertain to a talc powder composition which is useful as body powder, and thus, has nothing to do with the field of paint.

Accordingly, Chase and Ashton et al. provide no hint about the problem to be solved by the present invention and means to solve the problem.


For the above-mentioned reasons, the present invention is unobvious from Masuda et al. in view of Bähler, Ohtomo et al. and Chase et al.

No further issues remaining, allowance of this application is respectfully requested.

If the Examiner has any comments or proposals for expediting prosecution, please contact undersigned at the telephone number below.

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